

BEST PRACTICES COMMITTEE

E-Training White Paper

EGov Initiative



E-Training Best Practices Whitepaper

Background:

In August of 2001, the Office of Management and Budget (OMB) launched the QuickSilver initiative to identify e-Government best practices and those e-Gov programs underway in the Government that had the potential to provide economies of scale. Several hundred such programs were identified and evaluated by the President's Management Council using the balanced scorecard approach. Based on this evaluation, 24 e-Gov initiatives were identified as having potential for applicability Government-wide. In fact, e-Training ranked in the top two or three among the most important cross-cutting government initiatives.

The QuickSilver committee defined e-Training as training or education delivered via electronic means. This encompasses Internet and corporate intranet online learning, as well as CD-ROM-based products and other computer-based training (CBT). The most common form of e-Training is interactive, web-based courseware delivered over the Internet/intranet. E-Training also:

- Provides the ability to e-link strategic goals of an organization to competencies and skill gap identification, which in turn can link to career paths, and finally to on-line individual development plans (IDPs) and courseware. Significantly, e-Training can be easily linked to standards-based directories, human resource systems, and time management systems to help both managers and employees gain control over the management challenges of training;
- Incorporates technologies and strategies to enable enterprise-wide skill testing and certification;
- Serves as a robust, effective performance measurement infrastructure;
- Refines and focuses human competencies against defined learning road maps;
- Uses continuous feedback in the training-to-performance process;
- Provides the means to link training to knowledge management, with the ability to link to expertise sharing centers and knowledge sharing forums.

Therefore, with the Office of Personnel Management (OPM) as the managing partner, a strategy was adopted to jump-start the e-Training initiative by rapidly establishing a highly visible and fully functioning web-based center, around which will then evolve the full spectrum of cross-agency programs and services envisioned in the e-Training business case analysis. By coordinating policy, standards of interoperability, content selection, and outreach through OPM's Human Resources Development Council (HRDC), OPM and its partners will ensure an effective government-wide orientation grounded in performance measurement, competencies, and other aspects of human capital management. And by building on an established, successful and scalable multi-agency program such as the Transportation Virtual University's National Learning Center, OPM will integrate and consolidate existing resources and expertise from all levels of government to focus from the outset on collaboration, best practices and economies of scale.

Working in partnership with the Federal CIO Council Best Practices Committee, the Industry Advisory Council (IAC) was charged with addressing key challenges that OPM and other government leaders are currently confronting. This document is the formal response to the identified challenges, leveraging best practices from commercial, and government initiatives. The questions or “challenges” to which IAC was asked to respond include the following:

- Challenge 1 - Addressing cultural and change issues
- Challenge 2 - Identifying and implemented best of breed solutions
- Challenge 3 - Components of a “best practice” e-Training course
- Challenge 4 - Measurement technique and metrics
- Challenge 5 - Education and marketing strategies
- Challenge 6 - Competency management
- Challenge 7 - Standards
- Challenge 8 - The lessons learned from large e-Training systems

In responding to these challenges, three themes emerge:

- 1. Mission requirements drive learning requirements. Without a detailed understanding of business objectives, it is not possible to design and implement an optimal e-Training solution.** In order to achieve an order of magnitude benefit from an e-Training initiative, each organization has to establish business goals, measure the progress of the goals, and provide executive sponsorship and support to achieve the desired outcomes. These business goals should be articulated in the business case, should lead to the development of measurable competencies and behaviors that relate to an organization’s business objectives, and should serve as the criteria for evaluating centralized and decentralized options for various training functions.
- 2. There is no single system, e-Training course, change management tactic, marketing approach, or other technique that is a “best practice” for all organizations.** One approach, even a best practice for one organization, may not be appropriate for another. Thus, the question is not “should the system and responsibilities be centralized or decentralized?” Instead, the question is “what are the functional and technical requirements?” Answering this question will lead to the design and implementation of an optimal e-Training solution.
- 3. There are no short cuts to addressing the challenges identified in this document. In each case, a systematic, data-driven process must be designed and executed.** A change management process, predicated on the successful development of a compelling business case for learning and a comprehensive learning strategy, requires formal executive sponsorship, stakeholder management, and communication plans. A best practice infrastructure must emanate from a detailed requirement process, including a plan for standards compliance and conformance. Effective competency management requires the identification of skill sets needed for various job roles based on business objectives. Effective measurement techniques necessitate the creation of metrics and approaches at the beginning of the process, not at the end. Finally, a best practice e-Training course should use a best practice instructional system development (ISD) process, ensuring alignment of learning with needs.

Best Practice Findings:

Challenge 1: What can we learn from the history of large organizations with cultural and change issues similar to the Federal Government that have confronted a task such as ours--developing and implementing an e-Training system? Issues to be addressed include individuals that stovepipe organizations in order to do their own thing; difficulties putting the needs of the many in front of the few; forming partnerships, and gaining trust and collaboration)? How did these organizations successfully accomplish this task?

A). How did the organizations studied overcome parochial viewpoints to achieve a common, global, less "me-oriented" vision? How do we help organizations to keep key decision makers informed, garner the participation of champions, build internal strategic partnerships, and provide support for the implementation of a common e-Training system?

To align the multitude of stakeholders that would be impacted by an e-Training initiative, to establish an overarching vision, and to build support for implementation requires solid analysis, constant communication, and organizational resiliency. "The success of e-Learning depends on, not just the technology, but also on leadership, human support, alignment of learning topics to the appropriate learning environment, recognition and rewards for participation and success, plus a myriad of other factors. In short, e-Learning requires a disciplined approach, with balanced attention to business goals, culture, and technology."¹

The best practice in achieving these goals is to develop a compelling, data-driven business case and formulate a comprehensive learning strategy that reflects the input of multiple stakeholders. Developing the data-driven business case and formulating the enterprise-wide learning strategy requires a number of activities:

- **Identify Business or Mission Drivers and Performance Measures:** An effective learning strategy must be linked to overall organizational objectives. These objectives must be identified and prioritized to ensure that the resulting strategy reinforces organizational goals. Based on these drivers, performance measures and targets for learning must be developed. These targets could include specific cost savings, learning outcomes, productivity enhancements, operational efficiency, recruitment and retention goals, compliance, innovation, and employee satisfaction.
- **Assess Learner Needs and the Current Infrastructures:** Conduct a detailed assessment of strengths and weaknesses of current learning programs, technical infrastructure and facilities, and factors that might influence an implementation timetable (e.g., other process improvement initiatives or system implementations) A careful analysis of intended audiences, competency profiles, and performance objectives is also required, leading to the identification and prioritization of relevant competencies and skill gaps of employees based on an organization's strategy.
- **Formulate/Refine the Learning Strategy and Implementation Plan:** Based on performance targets, the learner needs, and the current infrastructure, alternatives for

¹ Gartner Research, "E-Learning: Strategy and Planning," November 5, 2001, p. 18.

the learning strategy should be developed (e.g., centralized e-Training approach and infrastructure, decentralized approach, hybrid approach), and the preferred approach selected according to key business driver criteria. This analysis should not reflect any bias, but instead should rely solely on how these business drivers are impacted. Finally, an implementation plan for this strategy should be developed by examining key tasks, ongoing initiatives, available resources, seasonality of operations (if applicable), and other factors.

These activities should yield a business case for learning (the Why) and the overarching strategy (the What and How). Specifically:

- **Business Case for Learning:** In the business case, the objectives of the learning initiative should be identified and prioritized. Additionally, the compelling business case should articulate the benefits – quantitatively and qualitatively – of the learning activities in a manner that can be measured. Additionally, learning initiatives should link to and reinforce other human capital management efforts including recruiting, compensation, and benefits administration, and succession planning. In the business case for learning, those linkages should be identified and articulated. Finally, the return on investment (ROI) for the learning strategy should be developed and incorporated into the business case for learning, with specificity on metrics and evaluation techniques included.
- **Learning Strategy:** The learning strategy should include the organization’s vision for learning, staff development, and human capital management initiatives that are explicitly linked to business objectives. This strategy should also leverage the efforts of organizations that have deployed best practices for learning activities, or are recognized leaders in human capital management. Additionally, a summary of the needs assessment should include an audience analysis that documents and prioritizes needed skills and competencies, as well as a learning approach that documents the requirements of learning to be delivered (e.g., who, what, how, where). Further, high-level curriculum paths should be developed that identify competencies and skills required per job role. Finally, the roadmap for deploying this strategy should consist of an implementation timetable, key tasks, and required resources.

A data-driven business case and compelling learning strategy should provide the rationale to garner organizational support for the implementation of a common e-Training system. Many organizations have found that an independent analysis of options often determines that a common e-Training infrastructure yields compelling benefits related to cost, consistency of delivery, reporting capability, scalability, and improved services.

B). How did organizations approach and overcome IT compatibility issues (i.e., did they migrate to one common system, or did they work toward interoperability at a common level among several systems, including different types of firewalls, levels of security, network protocols, and data exchange) to ensure delivery of an operationally unified system that facilitates an apples-to-apples comparison?

Best practice organizations recognize that there is no “magic solution” to overcoming IT compatibility issues and other e-Training system design challenges. An organization’s existing networks, systems, data definitions, standards (e.g., content, regulatory, and IT), network protocols, and security all influence determination of the “right solution” for that

organization. For example, if a large organization is comprised of distributed business units that all abide by common data definitions; it is a viable option to develop interfaces for these systems to meet certain reporting requirements. In contrast, where data definitions are not consistent, such integration is challenging, and often helps build a case for a centralized solution to provide needed reporting functionality.

To determine a feasible approach that incorporates IT compatibility issues into system design, selection, and implementation, best practice organizations develop and follow a structured process that includes the following activities:

- **Analysis:** Includes the examination of business objectives, vision, learning environment, IT infrastructure, and data models
- **Definition:** Includes the definition of business and technical requirements, evaluation of centralized/decentralized options, evaluation of specific packages, and data and content conversion strategy.
- **Design:** Includes package installation, prototyping and gap assessment, and environment design for IT, operations, network, data, and content.
- **Construction:** Includes package configuration and customization, data and content conversion, content integration, and testing.
- **Implementation:** Includes transition plan finalization, data and content migration, and system implementation and go-live.

As part of the analysis and definition phase, a key question is whether certain functions should be provided centrally or by individual business units (or in this case, agencies). To answer this question, best practice organizations do more than weigh the merits of a “centralized” versus a “decentralized” approach. They realize that few solutions are entirely based on one approach or the other; thus, the options are **not** mutually exclusive. So how do best practice organizations determine whether they work toward interoperability at a common level among several systems or migrate to a single system? The decision process involves a thorough and often laborious evaluation of options related to requirement areas. These areas could include:

- **Competency management** - such as associating job profiles with specific competencies, set tracking, and gap analysis.
- **Enrollment services** – such as scheduling, registration, and enrollment approval processes.
- **Individual development plans** – such as histories aligned with plans.
- **Learning delivery** – such as launching and tracking electronic learning solutions, conduct assessments, and tracking instructor and course evaluations.
- **Reporting** – such as reports that summarize available courses, enrollments, skills set gaps, learning outcomes, and ROI.

For each of these areas (and others not listed), organizations evaluate the advantages and disadvantages of the existing decentralized systems, perhaps integrated, versus a single system (not unlike the questions asked prior to ERP implementations). While organizations are increasing centralizing learning and supporting infrastructures in recognition of the strategic importance of learning, there is no “right” answer. The correct approach derives from an organization’s vision, objectives, and specific business requirements. Often, the “right” answer is a hybrid approach in which many centralized learning management functions are complemented by local

responsibilities. Thus, a centralized e-Training system is not “one” option, but instead is a continuum of options based on varying levels of centralized functions. These options could represent a variety of “centralized e-Training systems” including:

Option	Description
Enterprise Level, Open CMI System	Scalable for large-scale implementations Adherence to industry standards Interoperability with third-party courseware and off-the-shelf authoring tools Combination of e-Learning and classroom management functionality Connectivity to ERP/HRIS systems
Classroom Management System	Classroom management, tracking, and scheduling capabilities Classroom enrollment and wait-listing Resource management (books, CDs, and videotapes) Performance data tracking for offline learning events Launches and tracks e-Learning and online assessment
E-Learning Launcher and Tracker	Generally much lower cost than an enterprise LMS system Interoperability with third-party courseware and off-the-shelf authoring tools Adherence to industry standards Platform for launching and tracking all forms of training
Application Service Provider (ASP)	Subject matter experts can generally author content from remote locations using only a browser Often features robust built-in assessment creation tools Web-centric; often requiring no plug-ins or local client applications to access administrative data Strong offering as a hosted solution – can literally reside anywhere on the Internet or company intranet Includes e-commerce functionality
Competency Management System	Tracks and manages performance to the individual skill level (as opposed to tracking course level performance) Strong skill-gap analysis capabilities May include career mapping capabilities such as succession planning (mapping a learner’s current skill level against a future job position and defining deficiencies like 360 degree evaluation tools) Keeps historical performance records for regulatory training
Content Management Systems	Strong emphasis on content creation and storage Uses some form of “learning object” repository for intelligently organizing content Includes e-commerce functionality
Content Library	Focus is on off-the-shelf content libraries Learning management functionality (although often robust) may take a back seat to the content

The use of an ASP, providing the organization has Internet access, is often the most successful approach. Most ASPs have similar standards and use common browsers. They thus furnish a low-cost and low-risk way of implementing e-Learning. Compatibility is much easier than even a few years ago, thus any decisions made in the past that were based upon compatibility should be carefully reviewed.

Privacy issues are often brought up as a “red-herring” to stop enterprise deployment of e-Learning solutions. In reality, all major training companies generally have sufficient security built into their solutions to satisfy the majority of users. An exception is training on classified information, which is typically handled separately. In these cases, the e-Learning solution can generally be deployed behind the firewall.

Other considerations are Section 508 of the Americans with Disability Act (ADA). This is a very complex subject, but fundamentally ADA requires that e-Learning courses be accessible by those with handicaps. While there is currently a lack of ADA-related standards, certain agencies are working to establish consistent standards. Most major vendors either have addressed or are addressing this subject.

Finally, when addressing IT compatibility issues, organizations should consider the experience of Cisco. When they began their e-Learning efforts, Cisco found independently developed, non-integrated systems with redundant functionality among its business units. Over the last few years, Cisco has migrated to a common learning management system after identifying and prioritizing the business requirements that justified such a migration.

As a result of this experience, they offer the following recommendation: “The market for off-the-shelf solutions is somewhat immature and the ability of small vendors to produce quality products and meet deliverables against aggressive timetables will continue to be a challenge to the industry. Anticipate working with vendors in the role of development partner rather than as a traditional customer.”²

C). How did they keep things moving along (real strategies) through roadblocks, such as organizations or individuals, that periodically held up progress?

The development and deployment of a formal change management plan is needed to proactively identify and mitigate roadblocks to success. The change management plan should include a number of formal components. At kickoff, for example, the e-Training initiative should also launch the following programs:

- **Executive Sponsorship:** “Executive and management sponsorship is critical. E-Learning is a shift in thinking about how people can and will experience learning. Executives must understand and communicate the reasons for e-Learning, the benefits to be gained and the value proposition for employees, customers, and partners to participate. Performance measure systems for managers should include support of e-Learning initiatives.”³ “Beyond mere management support, organizations like IBM use terms like ‘commitment’ to describe executives’ degree of involvement. Regardless of how participants evaluated the degree of executive-level support, they all considered that such a high level of involvement was critical to the success of their e-Learning implementation.”⁴ For the *Know the Net* course at Dell, Michael Dell personally sends e-mails to course participants and insists on receiving a status report on the percentage of people completing the training successfully.⁵
- **Learning Council/Steering Committee:** “In some organizations, a single champion or evangelist is primarily responsible for kick starting the e-Learning implementation. However, most participants’ data suggest that the impact of e-Learning on the organization is significant, forcing changes in accounting processes, IT and training systems, and staff assignments and skills. It is therefore logical that most organizations monitor and continuously improve their implementation by using a Learning Council or

² Brandon-Hall.com, “E-Learning Across the Enterprise,” 2000, p. 72.

³ Gartner Research, “E-Learning: Strategy and Planning,” November 5, 2001, p. 18.

⁴ Brandon-Hall.com, “E-Learning Across the Enterprise,” 2000, p. 27.

⁵ Brandon-Hall.com, “E-Learning Across the Enterprise,” 2000, p. 27.

similarly-named steering committee to ensure that learning initiatives meet business needs. One organization explains: ‘We had to make e-Learning an enterprise-wide project similar to what we’ve done in the past with financials, HR, and PeopleSoft implementations in order to get buy-in from stakeholders. That’s why the E-Learning Business Council was formed.’”⁶

- **Communication Plan:** An overarching communications plan that is continuously deployed, monitored, and updated must be developed to support an enterprise-wide e-Training initiative. This plan should include intended audiences, key messages, methods, responsibility, required resources, and timetable. Additionally, this plan should enable a two-way communication, ensuring that real-time feedback is received, digested, and incorporated into the learning strategy and implementation plan. Finally, key components of the business case and learning strategy must be regularly communicated to stakeholders to ensure that the compelling rationale for moving forward is understood by all. This vision and rationale should serve as key messages that are incorporated into the communications plan.
- **Knowledge Management Plan:** The sharing of information is critical to obtaining and sustaining stakeholder buy-in. Intranets and the Internet offer effective vehicles for information sharing, as do already-implemented knowledge management systems. Information that best practice organizations share includes analyses that led to the business case and strategic plans, drafts of the business case and strategic plans, meeting minutes, implementation plans, learner feedback, and pilot results.

As the e-Training initiative is rolled out, additional components of the change management plan should be deployed. Specifically:

- **Timely, Regular, and Easy-To-Understand Reports on the e-Training Initiative:** To secure and build support for the e-Training initiative, regular reporting on status is critical. For example, the core team, Learning Council, and executive sponsors might receive a weekly report with metrics such as implementation progress, available courses, registrations, enrollments, learner feedback, return on investment (ROI), and organizational impact. Reports that are more general might be distributed to a wider audience (and available on an organization’s Intranet) on a monthly basis. Regardless of the target audience, all reports should also acknowledge and celebrate the achievement of milestones.
- **Tailored Stakeholder Management:** Effective communication planning, internal marketing efforts, data collection, and knowledge management must be targeted to individual stakeholders. Stakeholders could include the senior management team, the current training organization, customers or suppliers (if applicable), learners, pilot participants, and others. Each stakeholder requires a tailored change management approach to attain optimal effectiveness.
- **Strategically Selected Pilots and Publicized Quick Wins:** “A number of companies that we talked to have opted for a “start small and grow” philosophy. One of the biggest advantages of e-Learning, particularly Web-based solutions is the ability to scale up as demand increases. Even companies like Cisco and Motorola, that have developed enterprise-wide e-Learning strategies, have started by rolling out e-Learning on a

⁶ Brandon-Hall.com, “E-Learning Across the Enterprise,” 2000, p. 28.

limited basis to carefully selected employee populations. Cisco used a phase rollout e-Learning: initially to a subset of the sales force, then to the entire sales force, and finally to its sales channel partners. In Motorola's case, the plan is to start first with the IT department and recent graduates, those who are more accustomed to technology and are more likely to accept e-Learning right away. As momentum builds, Motorola will then roll out e-Learning more broadly across the organization."⁷ Similarly, identifying and publicizing "quick wins" to demonstrate progress for key stakeholders also builds momentum.

- **Designing Supportive Human Resources Processes, Policies, and Procedures:** Successful learning programs become an integral part of the organization, integrating into new employee orientations, goals for performance evaluations, and implementation of organizational changes. It is thus advisable to work with Human Resources to develop a policy in which all new hires are introduced to the learning program during their initial orientation to the organization. Ideally, organization should institute a policy that requires all employees to have a personal training plan, monitored and updated regularly, that is part of the job description. Further, annual evaluation plans should recognize progress against individual development plans, address skills set gaps, and measure the progress of subordinates. When managers and employees see that those who use the e-Learning program are rewarded they will continue to take advantage of the program and overall usage will increase. Recognition for managers is especially critical. For example, if a manager is recognized for saving "X" dollars by using e-Learning other managers will be motivated to do likewise. Conversely, if a manager spends a large sum on classroom training, training that could be accomplished through e-Learning, and then receives a training budget increase, other managers are likely to follow suit.

D). Specifically in e-Training, once the system is built (and during the process), how did they get people to come? What "training" do e-learners and managers need?

An e-Training initiative must *proactively* build acceptance among e-learners and managers. To build acceptance, internal marketing, learner support, and rewards and recognition are needed. "E-Learning does not sell itself to employees! Best practice organizations are persistent in the use of a variety of communication and change management vehicles, along with targeted and compelling messages to inform, educate and motivate line managers, instructors, employees and other e-Learning stakeholders."⁸

A study by ASTD and The Masie Center of 30 courses and 700 learners found an average participation or "start" rate of 58%, with participation for voluntary courses at only 32%, and participation for mandatory courses at 69%. However, some of the courses did achieve full participation. The highest participation rates occurred when courses had an internal champion, were tied to performance reviews, were not taken at the desk, and were given intense marketing and promotion.⁹

⁷ Brandon-Hall.com, "Building the Case for e-Learning," 2001, p. 58.

⁸ Brandon-Hall.com, "E-Learning Across the Enterprise," 2000, p. 36.

⁹ ASTD and the Masie Center, "E-Learning: 'If We Build It, Will They Come?'" 2001, p. 15.

This study also found that there were three drivers behind e-Learning acceptance: marketing and promotion, support of the learner, and incentives. Specifically:

- **Marketing and Promotion:** The most popular methods of course promotion included e-mail and face-to-face communication, although memos, Internet, telephone, and newsletters were also used. The study found, however, that no single approach was sufficient. Instead, a multitude of formal communications and testimonials were needed to attract interest. Additionally, the study revealed that targeted contact with the prospective learner represents the most successful marketing channel. Just as online retailers are now realizing that traditional marketing methods (i.e., catalogs) are necessary and effective in building their customer base, so managers must not abandon the traditional classroom marketing methods.
- **Support of the Learner:** Support for e-Learners included necessary equipment, technical support, SME support, manager support, and co-worker support. According to the study, opportunity remains for stronger manager and co-worker support, thereby demonstrating the value of the course. Specifically, the manager plays an essential role by:
 - Explaining why the learner should take the course
 - Motivating the learner by linking the course content to the workplace and business objectives, as well as to future career opportunities
 - Displaying an interest in the course and giving as much status and importance to it as attendance at a classroom course
 - Providing context, assignments, and work samples to help transfer the learning to the reality of the workplace
 - Assigning peers to provide support and dialogue with the learner to reduce confusion and to assist with transfer
- **Incentives:** According to the ASTD/Masie Study, while mandating a course can increase its participation; most incentives offered did not increase participation in voluntary courses. However, “Learners are driven most by their own intrinsic motivation and personal development plans—not by external factors. Only 12% and 22%, respectively, received financial or non-financial incentives to take the course, 79% and 77%, respectively, believed the skills and knowledge they gained would be useful within or outside the organization.”¹⁰ Obtaining skills that would be useful for current or future jobs was, by far, the most significant benefit of participation.

¹⁰ ASTD and the Masie Center, “E-Learning: ‘If We Build It, Will They Come?’” 2001, p. 20-21.

Challenge 2: In terms of a learning portal and learning management system, what constitutes the "best of breed?" How does one provide/combine components such as multiple entry options (such as home, work, remote, palm pilot, across-the-country and the world), three clicks to course launch, and the most incredible and easy experience that a learner could have?

Every couple of years, it seems, a new technology solution comes along that captures the attention of organizations and businesses. For a while, it was ERP, followed by data warehousing, and then CRM. More recently, a whole slew of e-Business monikers has arrived: B2E, G2E, and C2C. Today, the latest technical wonders are e-Learning technologies.

Reading vendor promotional literature, an agency could easily conclude that it simply needs to purchase and implement a particular e-Learning product and all its problems will vanish. However, there are several market realities to consider:

- **The e-Learning market is vast and highly fragmented.** Currently, the global e-Learning industry comprises 5,000 suppliers. Among these, no single competitor accounts for five percent or more of the pie¹¹.
- **The value propositions of vendors are difficult to discern.** Some vendors sell content, some provide tools, and others provide technology systems and infrastructure. More recently, the market has seen the emergence of vendors providing support services such as online tutoring, testing, and accreditation. It is challenging to figure out what tools and services will truly add value.
- **The competitive landscape is rapidly shifting.** To further cloud matters, many companies are making forays into areas outside their initial value propositions, blurring the lines that distinguished them even a few months ago. Publishing companies are acquiring technology companies and content providers are building infrastructure. Finally, the basic business models of some old competitors are proving unviable. As a result, more than 35 companies have declared bankruptcy in the past 18 months¹² and others are looking for ways to be acquired. Overall, the market is highly volatile and in a state of flux.

Given the fragmented and evolutionary nature of the market, it is not surprising that there is no "silver bullet." While many vendors claim that they have end-to-end capability, none actually do. Today, the most effective approach for an organization is to select "best of breed" commercial off-the-shelf (COTS) solutions and creatively determine which components of which system it intends to deploy for the various aspects of its planned solution. Thus, without the "silver bullet," the best practice organizations determine requirements and outcomes, select "best of breed" products to meet these requirements, and integrate the various products into a comprehensive solution.

In this environment, what is the objective of an e-Training infrastructure, including a learning portal and learning management system? Overall, the infrastructure should enable personalization of learning and services, increase access, reduce delivery costs, enable competency management, streamline administration, and provide robust reporting capabilities. To meet these requirements,

¹¹ Gartner

¹² Eduventures

an e-Training infrastructure should consist of the following components, integrated to form a comprehensive solution:

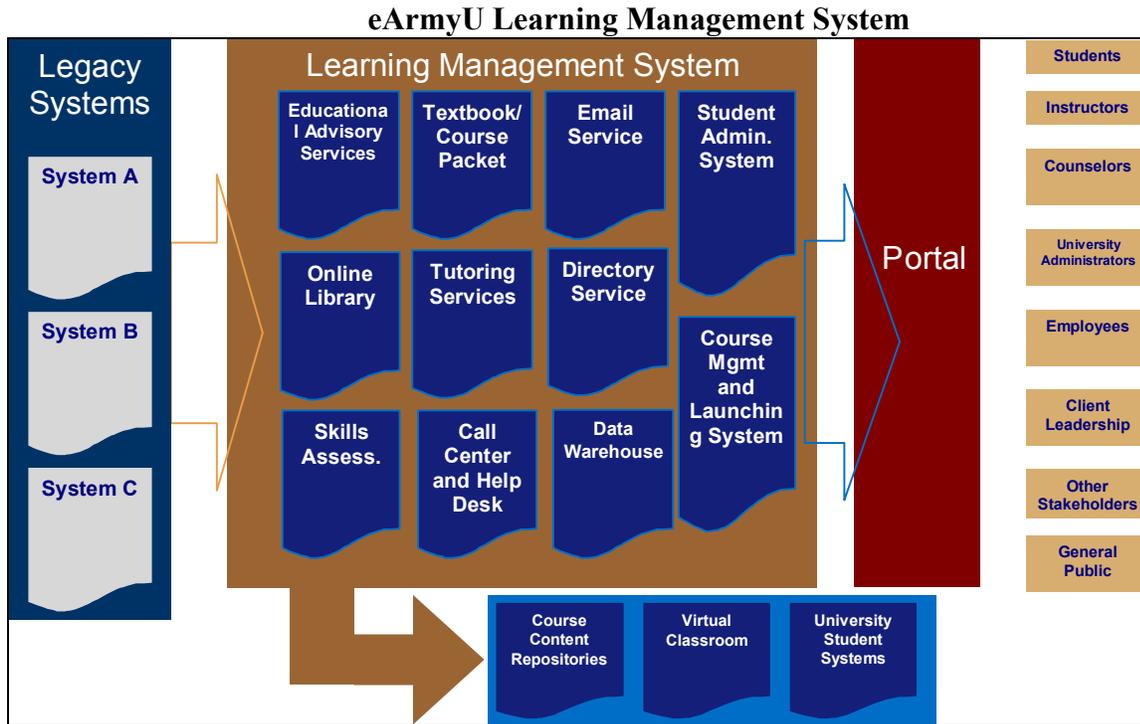
- **Content Standards:** a set of standards for all of the external content, as well as a common authoring tool for the internal content development (e.g., SCORM, AICC, IEEE).
- **Content Storage:** a learning content management system (LCMS) that stores updated versions of learning objects, enables the launch of these objects from any location, and tracks usage.
- **Learning Management System (LMS):** an LMS takes a centralized, organizational approach to learning in that it schedules and registers students for full online and off line courses, launches E-Learning courses, and tracks learner progress through these courses.
- **Learning Portal:** a web-based learning portal to make it easy and convenient for employees to find the information they need to support their learning objectives.
- **Legacy and ERP Integration:** integration with legacy systems and systems currently being implemented such as HR systems, financial systems, knowledge management systems, supply chain systems, data warehouse systems, and electronic performance support systems (EPSS), among others.
- **External Hosting:** A technology solution that hosts services outside of the firewall provides learning access for employees at both home and work, ensures scalability, minimizes traffic on an organization's network, and reduces costs.

But how do best practice organizations select the “best of breed” solutions? No single answer is right for all organizations. As mentioned previously, best practice organizations develop and follow a structured process that includes the following activities:

- **Analysis:** Includes the examination of business objectives, vision, learning environment, IT infrastructure, and data models
- **Definition:** Includes the definition of business and technical requirements, consideration of centralized versus decentralized options, evaluation of specific packages, and formulation of a data and content conversion strategy. Requirements related to access (e.g., enabling multiple entry points or global access), navigation (e.g., 3 clicks to course launch), and an incredible and easy learner experience should be documented during this phase to ensure the solution design incorporates these important features.
- **Design:** Includes package installation, prototyping and gap assessment, and environment design for IT, operations, network, data, and content.
- **Construction:** Includes package configuration and customization, data and content conversion, content integration, and testing.
- **Implementation:** Includes transition plan finalization, data and content migration, and system implementation and go-live.

This process should enable organizations to determine the needed components, select “best of breed” providers of these components, and knit together an integrated solution. A best practice of

this approach is the eArmyU Program. The eArmyU Program, offering soldier-students a radical, new way to “learn while they serve,” represents a best practice for legacy integration. The eArmyU Learning Management System, while externally hosted, was integrated with the Army’s personnel, education, and transcript systems within the first six months. Additionally, the myriad of best-in-class providers were integrated amongst themselves, providing “single sign-on” access for all learners. Refer to the figure below, the eArmyU Learning Management System.



Challenge 3: What does a "best practice" e-Training course look like? What are the key components? How does it interact with the learner and provide the highest level of quality learning?

Traditionally, an e-Training course is one that is delivered to the learner by an electronic medium, typically via the Internet or through a corporate intranet. However, it is difficult to provide details on a "best practice" e-Training course, as there are significant variables that must be considered when developing a course, such as:

- Audience required knowledge, skills, and abilities
- Desired organizational and individual outcomes
- Delivery methods
- Technology and infrastructure
- Measurement of outcome

Each of these factors can greatly impact the structure of an e-Training course and alter what is considered a "best practice." For example, training for complex tasks may require extensive simulation, while content focused on a corporate policy may not require any simulation at all. Each may be a highly effective course but follow different structures. A successful e-Training course must use the most appropriate technology, instructional design, and delivery method for the subject matter as well as the audience.

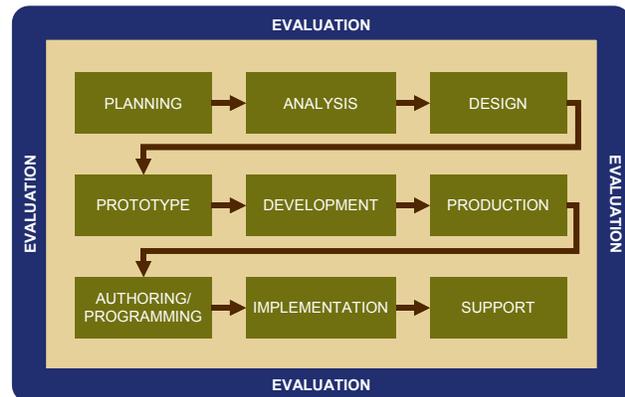
There are, however, some common characteristics and components. A "best practice" e-Training course consists of objective-based learning and criterion-referenced testing. The course combines relevant and job task-specific content organized by learning objectives and delivered with a high level of meaningful interaction. In its delivery, it uses a variety of techniques such as multiple choice-single selection, graphic hot spots, true/false items for recall, drag-and-drop for procedure and process training, multi-step simulations, timed choice, and streaming video with audio for application training. The graphics are relevant and of the appropriate size to ensure rapid execution of the program and fast screen display. The content is Section 508 compliant and will be packaged as learning objects as SCORM Sharable Content Objects.

Perhaps the most important criterion for an e-Training course is that it is designed to meet a specific learning requirement. Thus, since differing organizations have differing requirements, not all "best practice" courses are applicable to all learners.

The process for developing *or sourcing* a "best practice" e-Training course illustrates this point. The construction or procuring of a "best practice" e-Training course is based upon solid instructional systems development (ISD) methodology, including the following activities:

- **Planning Phase:** During this phase, requirements are reviewed, resources are assigned to tasks on the work plan, and a schedule is developed. A project launch meeting is a "best practices" activity that is critical to the success of the e-Training program. During the launch meeting, samples of the type and quality of e-Learning materials that will be developed for the target program are reviewed. The schedule, budget, deliverables, and assumptions are reviewed and approved, and a consensus is reached on the timetable, deliverables, and criteria for success.
- **Analysis Phase:** As with any type of performance problem, the key to success is identifying the problem as one that may be addressed by a training intervention. A thorough needs analysis involves:

- *Audience analysis*—defines the target population of learners with regard to reading level, education, learning style, computer literacy, and other characteristics that will help the development team create the most appropriate learning materials
- *Task analysis*—defines the job tasks to be trained and links the training to the job requirements
- *Content/Process analysis*—defines the work environment by identifying the processes to be trained on and the subject area to be defined
- *Environment analysis*—defines the learning environment with regard to delivery systems available for training, facilities, instructors, and workstations
- *Technology audit*—defines the technology delivery system capabilities in terms of bandwidth limitations, capabilities of the user computers, operating systems, and ability to handle media elements



- **Design Phase:** The “Best Practices” activities of the Design Phase include selecting the tasks to be trained, developing terminal performance and enabling objectives to these tasks, and arranging them into an objectives hierarchy. “Best Practices” objectives should contain the action, the condition, and the standard for mastery of the learning. “Best practices” test items should be created at the same level or lower of Bloom’s taxonomy as the objective they are measuring. During this phase, the evaluation strategy is defined. This may include either a simple posttest, a Kirkpatrick Level Two evaluation, or a more sophisticated diagnostic-prescriptive learning evaluation methodology that might also include computerized adaptive testing. Finally, a media selection matrix is used to define viable delivery systems based on the training requirements.
- **Prototype Phase:** In this phase, an item that can be “tested” is developed and then tested in a “proof of concept” environment. For an e-Training course, this testing would include one topic of instruction and one sample of each type of interaction, instructional strategies, and media element used, as well as the course menu and SCORM elements.
- **Development Phase:** The actual content is developed during this phase, employing storyboards to reflect the content and context of each screen of the presentation. Several tools have been developed that allow developers to create visually correct storyboards for review, which can expedite export of approved content as nearly-finished and functional e-Training in the form of HTML, DHTML, or JavaScript.
- **Production Phase:** Graphic and media element production are dependent upon the capabilities of the system to support visually stimulating and engaging images, and the creativity of the graphic artists and media producers. “Best Practices” include creating graphics that support the content and are not just “eyewash” to dress up a program. The medium elements should be developed, sized, and integrated with each screen to ensure maximum speed of execution. Smaller, less brilliant graphics that allow faster screen display are perceived better by users than large, stunning graphics that increase the wait time for the screen to display.
- **Authoring/Programming Phase:** During this phase, the e-Training content is authored or programmed, the media elements are integrated with the control logic, and the course is

finalized for delivery. “Best practices” for this phase include ensuring the program is ADA Section 508 compliant by testing the program with an assistive technology simulator such as JAWS that produces an audio output of what is shown on the screen. Similarly, while graphic artists are producing the media elements, a program such as Vischeck is run to show how each graphic looks to a person with color blindness. Importantly, each e-Training program should be developed according to SCORM standards, using “Best Practices” metadata tagging conventions, in a package with Sharable Content Objects, manifest, and associated XML documents.

The overriding “Best Practice” is to create programs that target user requirements, promote interactivity, maximize computer capabilities, allow delivery in 5 to 15 minute chunks, and combine graphics, text, and other media elements to approximate situations and scenarios typically encountered by the users in the work place. A program that increases job task knowledge and helps to develop job skills is a successful program.

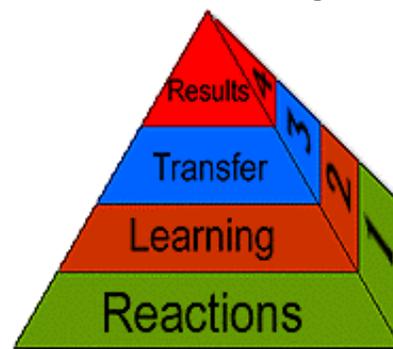
Challenge 4: How do "best practice" learning organizations measure the impact and the success of their e-Training efforts and/or systems? What metrics do they use (not customer satisfaction)? How do we measure how e-Training, especially when blended with other learning activities such as classroom or OJT, is impacting the organization's bottom line?

Traditionally, course registration and completion metrics have been widely cited as two measures of e-Learning program success. Experience has shown, however, that these metrics alone are not sufficient indicators of success, especially as content becomes more modularized and accessible in “chunks” as online support material. Organizations must recognize e-Learning as a performance support tool and judge it according to business-specific metrics.

In the past few years, changes in the government and its varied workplaces have required that employees continually expand their skill base, addressing organizational and individual development requirements through lifelong learning experiences. Many top performing organizations have found that technical “skills” are like the tip of an iceberg: the general competencies demonstrated by successful performers are just as important as technical expertise. *Competencies* are defined as *knowledge, skills, and other attributes that allow an employee to perform successfully on the job*. Measurable organizational performance improvement occurs when business-critical competencies, both general and technical, are the foundation of an organization’s training program.

Many organizations seek to deploy an evaluation approach based on Kirkpatrick’s training evaluation model, which includes four levels of assessments and is commonly considered a proven best practice in measuring the effectiveness and impact of training. Specifically:

- **Level 1 – Reaction:** This is a criterion “internal” to the training system that gauges trainees’ immediate reaction to the training, including levels of satisfaction with the delivery, course content, and environment.
- **Level 2 – Learning:** This criterion, also “internal” to the training system, is an important checkpoint that estimates the degree to which the trainee was able to understand and absorb the material. Typical methods of learning measurement include written exams, oral questioning, and hands-on proficiency testing.
- **Level 3 – Behavioral:** This is a critical criterion that is “external” to the training environment. Measured on-the-job, it assesses the effectiveness of training and the ability of the trainee to correctly apply learning in the job environment. It measures changes in the trainees’ actual behavior, as a result of the training. Assessment and metrics at this level will be closely tied to on-the-job training, on-going supervisor assessments, and actual performance data.
- **Level 4 – Observed:** This criterion is “external” to the training environment and estimates the impact of training on the organization, as observed in actual performance and business results. This level of assessment includes a process for determining the impact of learning relative to other factors that influence performance.



Business results and ROI analyses account for an increasingly larger portion of total learning expenditures. For example, leading firms such as IBM, Hewlett-Packard, Dow Chemical, and Allstate Insurance are starting to evaluate their multimillion-dollar training expenditures in terms of ROI or business results.¹³

Despite the growth in ROI analysis, level 1 and level 2 of the Kirkpatrick Model are still the most prevalent evaluation approaches. Overall, most common metrics used to measure e-Learning effectiveness are course completion (77% of survey respondents) followed by score comparison (pre-test to post-test with 55% of respondents).¹⁴ A small percentage of organizations conduct evaluations based on the business results of workforce development. For example, in 2000, 7% of ASTD's "Training Investment Leaders" evaluated training in terms of business results (level four in the Kirkpatrick evaluation scale).¹⁵

The effectiveness of training should be evaluated and measured against performance objectives using Kirkpatrick's Model. Effective evaluation provides an organization with the data needed to demonstrate both the quality of its services as well as its overall return on corporate learning investment. Effective evaluation processes are an integral part of the learning product design process and need to be incorporated into an organization's overall learning strategy

A systematic assessment process includes the following steps:

- Incorporate evaluation strategy and technique within initial business case for learning (as opposed to developing strategy and technique after launch). For example, meet with business unit leaders to gain agreement on the desired impact to the everyday work environment that training should provide. Thus, the evaluation approach should be incorporated into the learning strategy, technical infrastructure, and communication strategy.
- Incorporate evaluation strategy into individual development plans. Manager, counselor, and employee discuss employees' training needs and prepare a development plan. The development plan represents a commitment among the employee, the employee's manager, in which each party agrees to participate in the training. It defines competencies to be learned, training interventions, and each participant's responsibilities. It must agree with the organizational business priorities. The signed development plan encourages strong managerial support and individual involvement.
- Deploy evaluation technique across multiple levels of the Kirkpatrick framework. For example,
 - Distribute a short questionnaire during the pilot to gain early learner feedback (Level 1)
 - Employees attend training specified in their development plans and perform an initial KSA assessment that provides initial information on improvements (Level 1)
 - Use existing baseline assessment of skills to determine incoming knowledge level. Develop a skills mastery and upon course completion, conduct an assessment to determine knowledge, skills, and values acquisition (Level 2)
 - Managers coach employees on the job to reinforce behaviors learned during training and perform operational task/duty related assessments (Level 2)

¹³ Training, "Training Top 50," March 2001.

¹⁴ Online Learning, "State of the Industry Report," October 2001.

¹⁵ ASTD, "State of the Industry Report 2002," February 2002.

- Develop the approach and tools to assess the amount of course content that participants are using on the job three to six months post-training. This assessment is based on the objectives of the course and determined through tests, observations, surveys, and interviews with co-workers and supervisors (Level 3)
- Managers use Level 2 assessed improvements to quantify impact on a division or unit (Level 3)
- Conduct evaluation of business impact (Level 4) and ROI as appropriate
- Leadership uses Level 3 assessed improvements to quantify impact on the organization as a whole (Level 4)

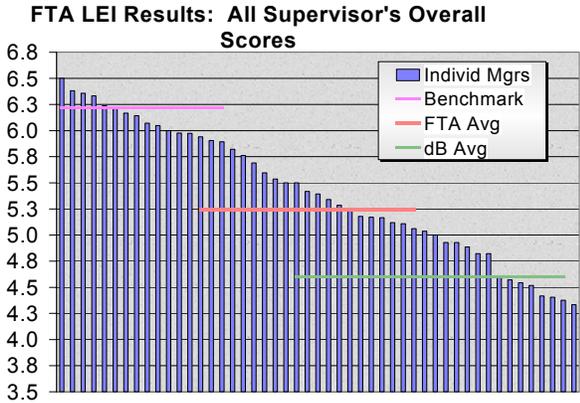
Many organizations have successfully deployed evaluation approaches to measure return on investment and impact on business results. The following table includes some recent examples.

Organization	Overview of e-Learning Impact
GTE	GTE has an integrated learning system with a combination of instructors, self-paced training on the web (or CD-ROMs), virtual university, learning management system, knowledge management system, mentors, and certification programs. Results indicate a 25% or more decrease in the time it takes salespeople to close their first sale, and a greater than 100% increase in the value of the first sale. (Source: Brandon-Hall.com, “Building the Case for e-Learning,” 2001)
Transportation Company	As part of a “service reliability program,” e-Learning facilitated the training of over 1,000 employees and resulted in new business processes being implemented one year earlier than would have been possible with traditional classroom training. “On-time delivery of goods increased 35%” resulting in over \$1M in additional revenues for the year. (Source: Brandon-Hall.com, “Building the Case for e-Learning,” 2001)
ARINC Inc.	ARINC develops and operates communications and information-processing systems for the aviation and travel industries. It does all its ISO training online via an intranet. ARINC expects that by 2001 at least 35% of all its training (not just ISO) will be web-based. As a result, every business unit involved was certified to ISO standards on the first attempt. Source: Brandon-Hall.com, “Building the Case for e-Learning,” 2001)
Global PC Company	Using e-Learning’s scalability, this company was able to train over 4,000 globally based sales and service representatives on a new product line. As a result, they were able to bring the product to market three months earlier than if they had used a traditional classroom solution. (Source: Brandon-Hall.com, “Building the Case for e-Learning,” 2001)
Boeing	Through a transition to e-Learning, Boeing has been able to increase course access rates by 1300 percent and decrease travel expenses. They also report improve “customer relations.” Source: SmartForce and THINQ)
Continental Airlines	From its e-Learning implementation, Continental reports more timely and accurate reporting and a substantial reduction in administrative costs. They also report “enhanced performance and customer service.” (Source: Saba)
CVS	From its e-Learning expansion, CVS reports higher technician pass rate for national exam and improvement in customer support and retention. (Source: THINQ).
Ford Dealers	An e-Learning initiative for Ford’s dealers resulted in a reduction of the cost of managing and delivering training. They also report better customer sales and service experience and increased employee and customer retention. (Source: Saba).

Starwood Hotels call center operators	Through a deployment of e-Learning, Starwood reports reduced training times for new services from 43 min. to 7 minutes, course failure rate of less than 1%, and a quicker deployment of training. Additionally, Starwood reports reduced supervisory time for call center operators. (Source: Click2Learn).
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Best Practices within the Federal Government for Measuring e-Training Return on Value (ROV)

The Department of Transportation’s Virtual University program has collected several years worth of data for many government organizations quantifying the correlation between overall employee satisfaction and satisfaction with employee training and development opportunity. Additionally, DOT data indicates very strong correlations between employee satisfaction and positive perception of the leadership of their organizations. This correlation is intuitive, but quantifying this correlation provides the basis for unique insight into the real value of a robust e-Training programs. The

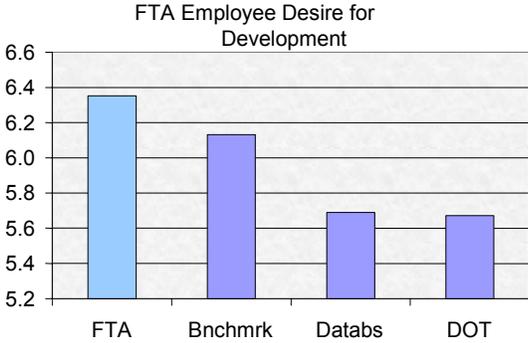


following Federal Transit Administration case study is an excellent example illustrating these results.

The Federal Transit Administration’s e-Training (FTA) Approach:

The FTA is using a thorough, systematic approach to deploy their new e-learning program. As a starting point, the FTA established baseline measures for key leadership competencies for all supervisors, and for each management factor using TVU’s LEI and Climate assessment survey tools.

These results were then reported back to managers, and individual results against each of the 17 leadership competencies were loaded into their web-based personal skills plan. Sample results for some key leadership competencies and management factors are shown in the adjacent bar graph.



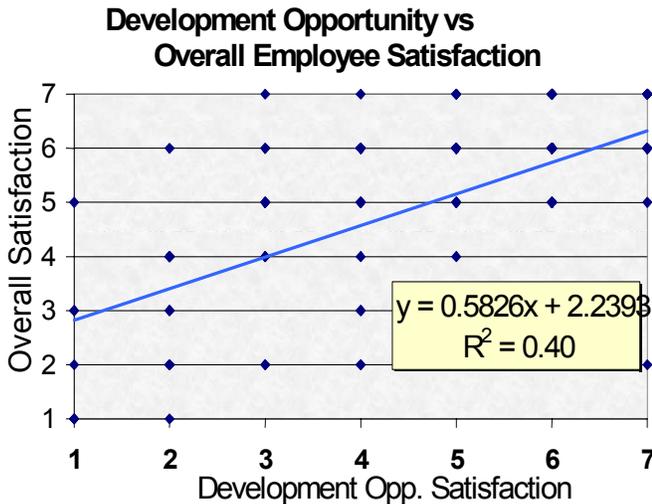
and individual results against each of the 17 leadership competencies were loaded into their web-based personal skills plan. Sample results for some key leadership competencies and management factors are shown in the adjacent bar graph.

The LEI and Climate assessment were used to identify FTA strengths and opportunities for improvement. Surprisingly, the FTA scored higher than the database average in every management factor. Therefore, possible areas for improvement were identified by comparison to the world-class benchmark, which is provided by the survey instrument.

Notably, FTA employees demonstrated a high desire for learning opportunities, which FTA management capitalized upon to drive employee satisfaction even higher by launching the e-learning program as a key strategy. As a result, employee satisfaction with training and development opportunity climbed from 74% to 79%, while dissatisfaction with training opportunity dropped from 16% to 12%. The impact of this on the bottom line of an organization cannot be overstated, as illustrated below.

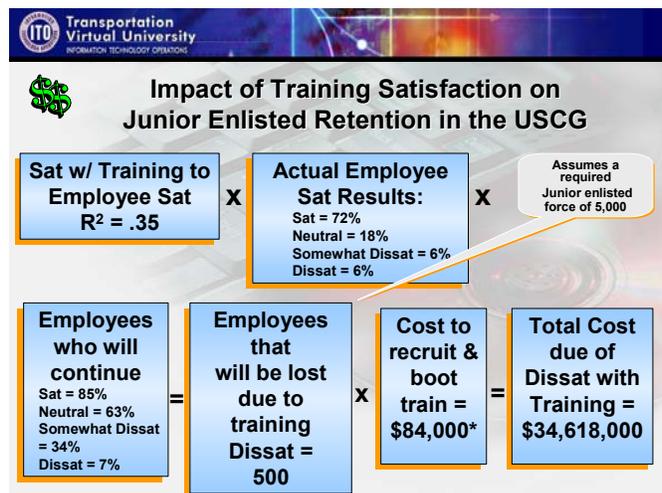
Employee Satisfaction Vs Learning Opportunity

FTA employee satisfaction was determined using the TVU climate assessment tool. When satisfaction with training opportunity is regressed on overall employee satisfaction, it reveals a correlation factor of 0.40. This means that about 40% of the variance in employee satisfaction is due directly to the variance employee's satisfaction with their learning and development opportunity; see the graph below.



To understand the impact of this finding, data used by assessment conducted for a US Coast Guard. The Coast Guard has long been in the vanguard of measuring their corporate performance, and has developed creative ways to model the impact of training on employee satisfaction. For example, the figure at the right shows actual results on the impact of employee satisfaction with training and development opportunity on employee retention among junior enlisted personnel.

It is a well-established fact that there is a strong correlation between employee satisfaction and the satisfaction of an organization's external customers. In fact, Tarp, a Customer Focus consulting organization that has helped a number of companies win the coveted Malcolm Baldrige National Quality Award, has done groundbreaking research in this area. E-Satisfy.com reports that there is as high as a .85 correlation between customer satisfaction and employee satisfaction. These results are astounding, since they imply that about 34% (.85 x .40) of the variance in customer satisfaction is attributable to employees' satisfaction with their learning and development opportunities.



Challenge 5: What are the key components and considerations in developing short- and long-term education and, marketing strategies (plans)? How do we best keep the communication flowing (back and forth) and reach out to a variety of groups such as stakeholders, key decision makers, potential learners, executives, etc.?

Gaining support at the executive level and throughout the organization requires short- and long-term education and marketing strategies. As previously discussed, executive sponsorship is key, and the business case for learning is a critical tool, as are the learning council, targeted communication strategies for the senior leadership, and regular reports.

Marketing strategies for the entire organization require similar commitment, but differing tactics. An ASTD/Masie Center study found that marketing and promotional efforts associated with e-Learning courses in the study were influential in attracting learners to the courses. Analysis of the data collected revealed that training functions must engage in at least four out of five of the promotional activities below before the start rate significantly increases:

- Use formal means of communication
- Use testimonials
- Have an internal champion
- Purposefully use managers/supervisors to promote the course
- Inform people about training more than once

Likewise, learners who were given ample notice were well informed, and who received extensive promotional information exhibited a greater willingness to begin the courses they were offered.¹⁶ Importantly, the study found that memos, e-mail, and other electronic communication such as intranet advertisements were not effective vehicles on their own, although they could be components of more comprehensive promotional strategy.

Unfamiliarity with e-Learning can be an obstacle. Dell Computers offers a unique approach to addressing this issue. Dell develops “e-magnets,” high-demand content that is only made available online. One of their first and most popular online courses, the “Dell Business Model,” was authored and approved by CEO Michael Dell. That course helped create user acceptance of e-Learning at Dell.¹⁷

Resistance from line managers and supervisors poses potentially the biggest hurdle to a successful e-Learning implementation. How does an organization overcome such internal obstacles? In American General’s case, resistance was countered through face-to-face meetings with managers to hear their issues and explain how e-Learning works. To accommodate managers’ concerns, American General’s customer service representatives were scheduled for e-Learning sessions during non-peak work hours.¹⁸

To increase learning acceptance, the ASTD/Masie study formulated a number of recommendations based on the analysis of the data collected, including:

¹⁶ ASTD and the Masie Center, “E-Learning: ‘If We Build It, Will They Come?’” 2001, p. 17-19.

¹⁷ Brandon-Hall.com, “Building the Case for e-Learning,” 2001, p. 58.

¹⁸ Brandon-Hall.com, “Building the Case for e-Learning,” 2001, p. 58.

- **“Use intentional, dynamic, and continuous marketing activities, as well as traditional marketing methods, such as face-to-face discussions and print advertising.** The companies surveyed report that they are currently doing these activities; however, there is a disconnect between what their training functions think they are doing and what their learners perceive. Since their perceptions are reality to the learners, companies need to be more aggressive and target their efforts at those learners who will most benefit from the courses being offered. Follow-up is especially important at the point of course registration (reminders and pre-Learning).
- **Create a learning culture: encourage and show appreciation for e-Learning. Successful e-Learning requires a top-down and bottom-up approach.** Upper management needs to create the expectation that employees are always learning and reward those that do so. This creates the motivation and need for individuals to learn and therefore be recognized.
- **Develop an environment in which peer support is endemic.** Peer support seems at first to be a too subtle means for motivating e-learners. However, peers can play a key role in motivating employees to take advantage of e-Learning opportunities. Peers can assist by taking on extra work while the learner participates in e-Learning courses. Co-workers can participate in mentoring programs blended with e-Learning that bear fruit in greater acceptance of e-Learning. Management’s role is to not just reward the learner, but to also reward those who support the learner.
- **Develop incentive programs beyond candy bars and meaningless certificates, like job ladders and peer recognition.** Organization can give away candy and ice cream bars if employees seem to like them, but should not rely on incentives to get learners enrolled in courses. Rather, organizations must show that the culture as a whole will reward their e-Learning efforts, and that the acquisition of new skills and knowledge can lead to more exciting and rewarding careers. Personal development plans are a useful tool to this end.
- **Blend e-Learning with other complementary forms of instruction.** Blended learning enables companies to attract employees who might be put off by technology. By offering e-Learning modules in conjunction with other types of training, the benefits are twofold. Those uncomfortable with e-Learning are eased into the experience, and those who know the technology are given an additional opportunity to show peer support—as mentors on e-Learning tools.”¹⁹

¹⁹ ASTD and the Masie Center, “E-Learning: ‘If We Build It, Will They Come?’” 2001, p. 29.

Challenge 7: How can we best approach developing a support framework (skill and/or performance identifiers) by which a search engine and/or learning management system can be organized, respond to inquiries about a course and/or a developmental need? What are the most common and/or best ways in which to organize-competencies, KSAs (knowledge, skills, and abilities), etc?

Prescriptive and adaptive learning technologies that will greatly enhance the ability to target content to a specific need are becoming available. Search technology is also readily available within mainstream LMS/LCMS products that enable searches across catalogues as well as to the lowest level supported by the content structure and composition. Meta-tagging is critical to the search capability and the tagging strategy should be clearly articulated for all new content design. For COTS content, users are typically restricted to searching within the vendor's meta-tagging scheme, although additional tagging can be added to description fields and course/content catalogs.

What are the most common and/or best ways in which to organize-competencies, KSAs (knowledge, skills, and abilities), etc?

There is no single best answer to this question as there are many views on the subject and many valid models, each with its own supporters and detractors. Rather than attempt to put forth specific recommendations that would likely be open to debate, the team chose to address general recommendations:

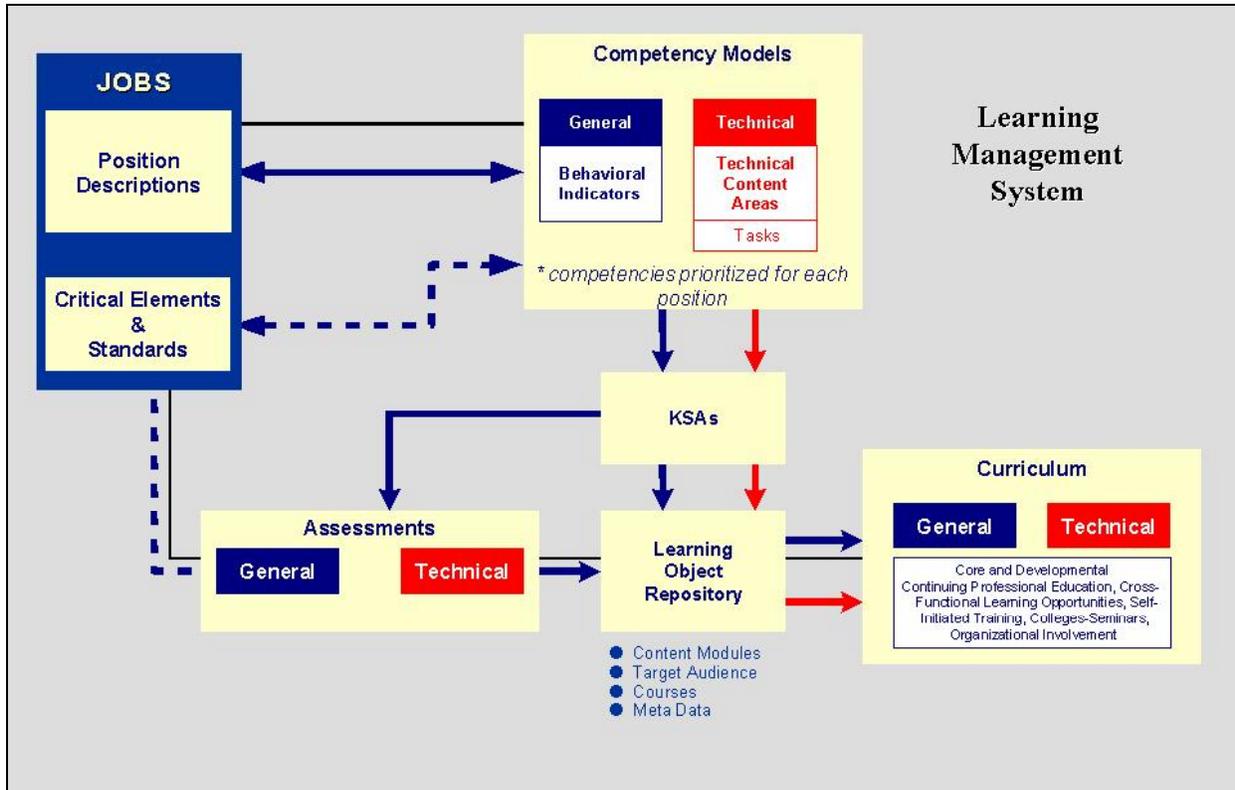
- **Choose Technology that Fits Your Need:** When implementing skill and competency management technology of any kind, it is critical to ensure that the technology can support the chosen taxonomy. Organizations should not have to change models to fit the technology.
- **OPM and the Federal Classification System Cannot Be Ignored:** Organization-specific skill and competency models should be aligned for the OPM managed models for Federal occupations. Typically, the OPM competency models provide a useful starting point for development of tailored models that reflect the specific jobs and role in an organization. Available validated industry standard competency models are also available and can be used as the foundation of more tailored models.
- **Organizational Commitment to Move to a Competency-Based System Is Critical:** To be effective at any scale, skill and competency management must be part of an integrated approach to human capital development and linked measurably to job performance and organizational performance. As with most facets of e-Learning, technology is rarely the issue or the impediment; rather the challenge is the implementation and integration of the technology within the organization. Organizational skill and competency data is no exception. There are a wide range of products on the market and in development that provide an excellent foundation for developing and managing an enterprise-wide skill/competency management program. The challenge for most organizations is developing the conceptual framework and acquiring the actual skill and competency data for managing human performance prior to buying and implementing the technology.

Organizational commitment and executive sponsorship are critical. Performing tasks like valid task and skill analyses and building occupational competency models can be very time consuming and expensive. As with any program, it is important to implement at a level where success is assured. Rather than attempt to implement competency management enterprise-wide, it is highly recommended that organizations start with small, well-defined occupational families. Once the

methodology and processes are validated, the approach can be applied across a wider base. It is also beneficial to target occupations with large employee populations or jobs that are deemed most critical to the organization.

Measuring performance accurately demands clearly defined metrics and measures of success. Assessments are critical features of human performance systems and though they are difficult to implement in the federal environment for a number of reasons, they should not be overlooked. There are successful federal implementations of effective assessments, especially where tied to specific job performance.

The following graphic offers a notional depiction of a federally-focused competency-based system.



Challenge 8: How do we best develop the standards for the course/content development, submission, functionality, and interoperability? What existing standards need to be considered (e.g., AICC, SCORM) and what are the key generic components that need to be taken into account?

Prior to addressing the “how” for standards, it is important to define the term “standards” first and then understand “why” standards are important.

Applicable standards can be categorized as follows:

- **E-Learning content standards:** Many of the prominent standards in the e-Learning market today include SCORM (Shareable Courseware Object Reference Model), IEEE (Institute of Electrical and Electronics Engineering Learning Technology Standards Committee), AICC (Aviation Industry CBT Committee), and IMS (Instructional Management System Global Learning Consortium). All of these standards refer broadly to interoperability of learning systems and online content.
- **Internal hardware or network standards:** E-Learning is but one use for the significant investment that organizations make in technology. Given that technology investments serve other purposes, it stands to reason that other standards or guidelines for systems and content have been established and must be followed. For example, the US Navy has established IT-21 standards for all hardware, as well as specific software standards, for the Navy Marine Corps Intranet (NCMI).
- **Regulatory standards:** Certain regulations have become, or will become, standards in the Federal Government and elsewhere. For example, section 508 requires that disabled employees have equal access to electronic and information technology.
- **Security standards:** Security standards for online systems continue to emerge. For example, the US Navy has begun to require adherence to DITSCAP standards, a series of security-related requirements for online content. Similarly, but more prominently, the Department of Defense (DoD) has established mobile code guidelines. To protect DoD systems from the threat of malicious or improper use of mobile code, we must assess and control the risks imposed by the technology. The guidance in the development and promulgation of policy is the first step in an iterative process to reduce such risks to DoD information systems. Existing policies categorize mobile code technologies and restrict their application within DoD based on their potential to cause damage if used maliciously. It is applicable to all DoD information systems used to process, transmit, store, or display DoD information, including commercial off-the-shelf (COTS) products and electronic commerce applications used but not owned by the government.

In discussing why and how to develop and imbed these standards within e-Learning initiatives, we will focus on prominent e-Learning content standards such as SCORM, AICC, and IEEE.

First, the *why*. It is indeed important to develop and adhere to a common set of standards for an e-Learning initiative. “This convergence of technologies is very important for the consumers of these technologies because products that adhere to standards will provide consumers with wider product choices and a better chance that the products in which they invest will avoid quick obsolescence. Likewise, common standards for things such as content meta-data, content packaging, content sequencing, quest and test inoperability, learner profiles, and run-time interaction are requisite for the success of the knowledge economy and for the future of learning. Why should an organization

care about the emergence and convergence of learning standards? The answer boils down to the organization protecting and increasing the return on its investment in the learning technologies it purchases and in the learning content and services it develops. Thousands, if not millions, of dollars will be spent on these technologies, content, and services to improve knowledge and skills. If the systems cannot grow, be sustained, maintained, and delivered to the learners, the investment will be wasted or seriously diminished in its ability to return effective results.

Standards help to ensure the five “abilities” mentioned below, and to protect and even nurture e-Learning investments:

1. Interoperability – can the system work with any other system?
2. Reusability – can courseware (learning objects, or “chunks”) be re-used?
3. Manageability – can a system track the inappropriate information about the learner and the content?
4. Accessibility – can a learner access the appropriate content at the appropriate time?
5. Durability – will the technology evolve with the standards to avoid obsolescence?”²⁰

Now, the *how*. To accomplish this requires a commitment to e-Learning standards, including the following activities:

1. **Formally, include compliance/conformance with industry standards into technical requirements that will guide all system selection (e.g., LMS, content authoring tools). However, objectively determine the relevance of standards such as SCORM, AICC, IMS, LRN, and IEEE to your specific requirements:** Standards have had a positive impact on the e-Learning community over the past few years, but it is important that their relevance to designing solutions that meet organizational business needs not be disproportionately represented. For example, in and of itself, SCORM compliance is not a valid measure of instructional design quality, accuracy, usability, or relevance to a particular learning need. SCORM enhances interoperability across platforms but it is still not a complete answer as there are minor differences in interpretations among vendors. Additionally, vendors often choose to extend AICC/SCORM functionality to optimize performance in a specific environment. It is critical that standards compliance be treated as an evaluation factor, not an absolute selection criteria.
2. **Implement a Learning Content Management System (LCMS) stand-alone system or module, to serve as the repository for learning objects:** LCMS’s can manage content versions and allows for the most updated version of the learning content to be launched from anywhere, optimizing the reusability of content. This functionality will quickly grow in importance. While 39% of training professionals have not heard of LCMS’s,²¹ by 2005 40 percent of enterprise will use learning content management systems to customize content delivery to students.²²

²⁰ The Masie Center e-Learning Consortium, “Making Sense of Learning Specifications & Standards: A Decision Maker’s Guide to their Adoption,” March 6, 2002, p. 8

²⁴ Brandon Hall, “E-Learning for the Enterprise: Why Learning Content Management Matters Most”, presentation at Online Learning 2001, Bryan Chapman, October 2001, p. 4.

²² Giga, “IT Trends 2002: E-Learning,” November 12, 2001.

3. **Develop an internal content develop process that leverages the use of learning objects for training and other initiatives:** The use of learning objects is a way of storing and managing investment in learning content, thereby allowing greater flexibility for creating just-in time and customized learning for employees, enabling re-usability of content, enhancing consistency of material, and reducing cost. In addition to online training, learning objects can be integrated within knowledge management systems, and Electronic Performance Support Systems (EPSS).
4. **Build consensus on the implication of standards compliance/conformance for systems and purchased off-the-shelf content:** One of the challenges that was widely agreed upon among the team was that different agencies are taking very different approaches to security, privacy, and 508 interpretation. These varied approaches, which are occurring even within agencies, often hinder the organization's ability to implement an e-Learning solution.
5. **In evaluating Section 508 compliance, consider the total system and not just the piece parts:** Conformant content playing through a non-conformant platform is NOT conformant, and vice versa. In system planning, organizations should take advantage of "equivalent facilitation" and "functional equivalence" provisions in the rules, not to circumvent the law, but rather to design accessible solutions that truly work for each individual user. Just as with standards, a bad system can be an accessible system.

Challenge 9: What are the "lessons learned" in the development of large e-Training systems that can help us to be successful and anticipate and overcome inevitable barriers?

The lessons learned can be categorized into three main categories:

- Enterprise Wide Strategy
- Learning Support Services
- Technology Infrastructure

Lessons Learned – Enterprise Wide Strategy

It is important to define a strategy that incorporates overall agency training and education objectives into the e-Training initiative. Large e-Training initiatives consist of a wide-array of strategic and tactical activities that an organization must undertake. To guide and prioritize e-Training activities, an enterprise-wide strategy must be developed and continuously updated. This strategy should consist of overall e-Training objectives, individual agency objectives, a situation analysis, the recommended approach, an implementation plan, and a business case.

In formulating an e-Training strategy, the following activities are best practices:

- **Identify business drivers:** an effective e-Training strategy must be linked to overall organizational objectives.
- **Develop performance measures and targets:** based on these business drivers, develop measures and goals for e-Training. These could include specific cost savings, learning outcomes, productivity enhancements/operational efficiency, recruitment/retention goals, compliance, innovation, and/or employee satisfaction.
- **Assess current situation:** conduct a detailed assessment of strengths and weaknesses of current learning programs, technical infrastructure and facilities, and factors that might influence an implementation timetable (e.g., other process improvement initiative, system implementations).

- **Formulate/refine the e-Training strategy:** based on targets and the current situation, identify e-Training alternatives, and select the preferred approach based on criteria built upon business drivers.
- **Prepare the e-Training blueprint:** An implementation plan for this strategy should be developed, including a compelling business case, implementation timetable, key tasks, and required resources.

Lessons Learned – Learning Support Services

Learning support services are an integral part of the learning experience and critical to learner success. Scalable support systems such as administrative services, marketing support, mentoring services, online libraries, or call center and help desk support give the learner the support he or she needs to be successful. Whether registering for courses, researching materials for an exam, receiving technical support, or assessing skills, the learner knows assistance and support are available. Many of these services can be provided online, enabling ease of access and self-service options.

In providing learning services support the following outcomes are viewed as best practices:

- Online catalog of learning options
- In-person and online registration capabilities
- Forecasting capabilities of demand and supply
- In-person and online mentoring services
- Outreach and marketing capabilities
- Learning history reports
- Competency management
- Individual development plans
- Online library and learning community capabilities
- Call center and help desk services, potentially 24 x 7

Lessons Learned – Technology Infrastructure

An e-Training development technology infrastructure should enable personalization of learning and services, increase access, reduce delivery costs, streamline administration, and provide robust reporting capabilities.

The technology infrastructure should enable an organization to:

- Develop, promulgate, and enforce technology standards for internally developed and externally sourced content
- Provide content storage capabilities for electronic content such as learning objects
- Provide content authoring capabilities
- Provide administrative capabilities such as scheduling, registration, competency management, monitoring of progress, and identification of skill gaps
- Provide easy, always-available, and self-service access to content and services
- Provide appropriate security of content and personnel information

An effective technical infrastructure supporting e-Training must be integrated with current and planned enterprise systems. At a minimum, the systems supporting the enterprise learning solution must integrate with systems such as:

- Human Resource Management System (HRMS)
- Customer Relationship Management (CRM) system
- Supply Chain Management (SCM) system
- Websites and supporting systems
- Data warehouse systems
- Existing systems supporting training and education
- Knowledge management systems
- Electronic performance support systems
- Existing authoring tools and systems

Lessons Learned – Key Points

- Clearly understand your organization's objectives and needs before launching an e-Training program
- Do your homework about vendors and clearly understand their capability – do not focus only on the “hype du jour”
- Consider solutions that have already been created to scale to your requirements; leverage what is feasible and thoughtfully tailor the solution to your own organization's needs
- Do not simply focus on on-the-job skill-based training – upgrading your workforce performance may require the implementation of a comprehensive learning curriculum which may include educational programs
- Do not only focus on the technology – new processes may need to be developed along with change incentive systems and an aggressive marketing and communication campaign.

APPENDIX
Team Members and Methodology

Methodology and Approach

A key customer of this compilation of best practices is the e-Gov, e-Training initiative, with OPM serving as the managing partner. Therefore, the initial focus of the effort was on collecting best practices for the “burning platform” issues OPM is currently facing in establishing the e-Training initiative. Personnel involved in the development of this paper are as follows:

Project Manager for the e-Training Initiative: Mike Fitzgerald (OPM)

Key Participants: Barbara Swanson (OPM), Joseph Kennedy (OPM)

Gov’t Leads: Larry Mercier (DOT), Sally Good-Burton (HUD), James Reeves (Treasury)

Industry Lead: Bruce Klein (H-P)

Best Practices Committee Co-Chairs: Sue Rachlin (DOI) and John Marshall (USAID)

Committee Members:

Patricia Marks	Hewlett Packard
Mike Simon	PWC Consulting
Michael Sousa	PWC Consulting
Jason Rigoli	KEI Pearson
Kevin Duffner	SmartForce
Jeff Rhoda	IBM
Brandon Hall	Brandon Hall
Dennis Stone	Thomson NETg
Don Cole	Knowledge Pool
Vince Penkala	Skillsoft

Approach Outline:

- HP facilitated and organized several face-to-face meetings, conference calls, collected input, and materials from each of the contributing committee members.
- Prior to meeting with the Government team, this group met several times to share ideas and discuss e-Training best practices.
- The team met with OPM’s Barbara Swanson and Joseph Kennedy to review key challenges and to agree on areas of focus.
- The challenges discussed in this document are the issues that the government team asked the committee to address.
- The team met a number of times to brainstorm ideas and divide out the research and writing.
- Once the document was created, the PWC team edited the content and compiled additional information that added significant value to the final document.

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